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A STUDY OF THE ROCKY MOUNTAIN SPECIES OF THE MULTIFLORI SECTION OF ASTER[1]

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No doubt it will be considered a very bold venture for an inexperienced student to make her début in botanical literature with a paper on a group of the genus *Aster* which has been the despair of many more experienced and wiser botanists than she. The results here published are due to the stimuli of repeated exasperations when attempting to place correctly members of this group which come frequently to hand for determination. No doubt the appearance of more discussion in this much discussed and too much named group, will stimulate exasperation among some workers but after several weeks of study the author feels that her results will bear publishing and sincerely hopes that they may be of some value to any who may be bewildered among the *multiflori-commutati* section of *Aster*, as she has been.

This group falls naturally into two divisions.

First, those plants that for years have been called *Aster multiflorus* Ait., but for which we must now accept the name *Aster ericoides* L., as has been pointed out by Mr. K. K. Mackenzie[2] and Dr. S. F. Blake.[3] This plant is characterized by an excurrent stem from which branches ascend and recurve bearing numerous heads in more or less secund fashion. The heads are rather uniformly small in typical material from eastern states but in our western plants tend to be larger and to show much variation in size. The involucres of these heads are well imbricated with bracts in 3–5 series. In general this

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[2] RHODORA **28**: 65. 1926.

[3] RHODORA **32**: 136. 1930.

is a tall plant ranging in height from 1 to 6 or 7 feet and often widely branched and bushy. Here the caespitose rootstocks often result in the formation of clumps each made up of several stems. Although *A. ericoides* becomes much more variable in its western range, as do many other species, nevertheless it always shows in some degree the characters noted above. Several specimens are at hand of Rocky Mountain plants which can not be distinguished from those of Iowa and Illinois. After long consideration it is impossible to recognize the various segregates which have been made and it seems wisest to call them all forms of a variable species.

Second, is the group separated by Dr. Gray under the name *A. commutatus*, and its allies, which has two characters which amply distinguish it from *A. ericoides*. In the first place its usually solitary heads are borne at the ends of leafy branches which are not recurved. Here the excurrent habit of the main stem is not so conspicuous and is never combined with the ascending, recurved, secund branches of the latter. In the second place, instead of forming clumps these plants form "loose but somewhat extensive masses through a system of branching rhizomes," as is very well explained by Dr. Greene in his original description of *A. adsurgens*. This character has been repeatedly observed by the author as exhibited by *A. commutatus* in the vicinity of Estes Park, Colorado. Within the *commutati* group the character of the bracts has been considered the fundamental distinguishing point, and that of the pubescence of stems and bracts of second importance.

Variation is prevalent, and numerous intermediates occur exhibiting the parent characters in all possible combinations, but here it is possible to separate at least three species satisfactorily if one will spend some time in study of those characters which are of specific importance in this group, and gain a mental concept of each specific unit. Perhaps this can only be gained by the study and comparison of a large number of specimens, but in an attempt to make these characters more readily observable to the average botanist a short key has been prepared.

One factor which contributes to the confusion surrounding this entire section is the wide range of nearly all of the forms involved. It is impossible to delimit the species geographically as the ranges of all overlap extensively.

This paper is based on the careful study of over a hundred sheets of

specimens in the Rocky Mountain Herbarium, comprising material from all the states west of the Mississippi except California and Nevada. Most emphasis has been put on the essentially Rocky Mountain species because the bulk of the material at hand represents plants of New Mexico, Colorado, and Wyoming.

Stem excurrent, with ascending, recurved branches; heads numerous, more or less secund; rootstocks caespitose.....*A. ericoides*
Stem branched or sometimes excurrent but branches not recurved-secund, terminated by solitary, or rarely few, heads; rootstock creeping.
  Bracts well imbricated in 3–5 distinct series; pubescence hispid, spreading.....*A. adsurgens.*
  Bracts nearly equal in length or the outer at least half equaling the height of the involucre.
    Bracts slightly imbricated, thick, strigose, squarrose..*A. commutatus.*
    Bracts about equal in length, thin, glabrate, not squarrose.....*A. falcatus.*

ASTER ERICOIDES L. Sp. Pl. **2**: 875. 1753. *A. multiflorus* Ait. Hort. Kew. **3**: 203. 1789. *A. hebecladus* DC. Prodr. **5**: 242. 1836. *A. scoparius* DC. l. c. not *A. scoparius* Nees. *A. multiflorus* var. *stricticaulis*, T. & G. Fl. N. A. **2**: 125. 1842. *A. polycephalus* Rydb. Bull. Torr. Bot. Club **33**: 153. 1906. *A. stricticaulis* (T. & G.) Rydb. Flora of the Rocky Mountains 885. 1917.

Representative Specimens. NEW MEXICO: Las Cruces, *Wooton* 465; Mangas Springs, *Metcalfe* 781; Jemez Mts., *Castetter* 669; Bernalillo, *Castetter* 900. COLORADO: Mesa Verde, *Haas* 80 and *Bader* 5; Arvada, *Clokey* 3908; Colorado Springs, *Warren* 1927; Boulder, *Ramaley* 2600 and 9757; New Windsor, *Osterhout* 3183; Fort Collins, *Cowan* 2697; Meeker, *Robbins* 7182. WYOMING: Hanna Creek, *Willits* 396; Lusk, *A. Nelson* 9604; Thermopolis, *A. Nelson* 9263. MONTANA: Bozeman, *Blankinship* Aug. 30, 1899. IDAHO: Region of the Coeur d'Alene Mountains, *Leiberg* 1588. WASHINGTON: Hunters, *E. Nelson* 1002; Yakima, *E. Nelson* 1168. NORTH DAKOTA: Jamestown, *C. C. Schmidt*, Sept. 8, 1897; Stump Lake, *Tufte* 286. SOUTH DAKOTA: Vicinity of Brookings, *Williams* Aug. 30, 1894; Custer, *McIntosh* 633.

The range of this species is from New England to the Pacific coast across the northern and central states and south into New Mexico, and in varying forms it has a still wider distribution.

ASTER ADSURGENS Greene, Pitt. **4**: 216. 1900. *A. crassulus* Rydb. Bull. Torr. Bot. Club. **28**: 504. 1901. *A. exiguus* Rydb. l. c. 505. Probably not A. *multiflorus* var. *exiguus* Fernald.

Representative Specimens. COLORADO: Piedra, *Schmoll* 1476; Bedrock, Montrose Co., *Walker* 396; La Veta, *Vreeland* 190a[1]; Pagosa

[1] The type number of *A. crassulus* Rydb. in the citation, Bull. Torr. Club **28**: 505. 1901, is given as *690a* with the same date which our sheet *190a* carries; undoubtedly there has been an error in copying the number but we are unable to determine which is correct.

Springs, *Baker* 637; Naturita, *Payson* 611; near Gunnison, *Warfel* Aug. 1926; Alathie, *Cowan* 2698 and 2992; Rye, Pueblo Co., *Clokey* 4343 and 4344; near Boulder, *Ramaley* a202 and a213. WYOMING: Buffalo, *Tweedy* 3106; Sundance, *A. Nelson* 9701; Sweetwater, *A. Nelson* 2891; above Sheridan, *Sharp* 233. SOUTH DAKOTA: Harding Co., *Visher* 694; Deerfield, *McIntosh* 840. EASTERN OREGON: Grand Ronde Valley, *Cusick* 3398. EASTERN WASHINGTON: Near Spokane, *Turresson* 69. ARIZONA: Flagstaff, *Hanson* 8.

It is with reluctance that I substitute a name which has been known only in synonomy for one which has become well established, but there is no other course open to me. Dr. Rydberg reduced *A. adsurgens* Greene under *A. commutatus* but a careful comparison of his original description and that of Greene reveals the interesting fact that Greene described, not *A. commutatus*, but the same species which Rydberg a year later described as *A. crassulus*. Their only point of difference is in the amount of pubescence on the leaves, which we know is a character subject to much variation within any species of this group. Leaf-size as given by Greene is not comparable with that given by Rydberg, for the former is speaking only of leaves on sterile shoots. The involucre of *A. adsurgens* as described by Greene definitely separates this plant from *A. commutatus*, under which for years it has been reduced to synonomy.

ASTER COMMUTATUS (Torrey & Gray) Gray, Syn. Fl. **1**: 185. 1884. *A. ramulosus* β. Lindl. in DC. Prodr. **5**: 243. 1836. *A. multiflorus* var. *commutatus* T. & G. Fl. N. A. **2**: 125. 1842. *A. incanopilosus* Sheld. Bull. Torr. Bot. Club **20**: 286. 1893. *A. multiflorus* of western authors, in part.

Representative Specimens. COLORADO: Estes Park, *Ashton* 234; Piedra, *Schmoll* 1442; Norwood Hill, San Miguel Co., *Walker* 428. SOUTH DAKOTA: Perkins Co., *Visher* 645. WYOMING: Centennial, *Goodding* 2111; Laramie, *A. Nelson*, 153 & 10644; 15 miles southwest of Laramie, *Merrill & Wilcox* 1170. MINNESOTA: Battle Lake, *Sheldon*, Aug. 1892. KANSAS: Rockport, *Bartholomew* 23.

The Colorado and South Dakota specimens are typical, in my estimation. Those from Wyoming show some variation of the involucres. That of Merrill and Wilcox, and Dr. Nelson's 10644 has rather short outer bracts and the bracts of Dr. Nelson's 153 and of the Goodding specimens show very little tendency to be squarrose. The center of distribution seems to be Colorado, from which it extends eastward and northward, often in slightly varying forms.

ASTER FALCATUS Lindl. in DC. Prodr. **5**: 241. 1806. *A. ramulosus* Lindl. l. c. 243. *A. Cordineri* A. Nelson Bot. Gaz. **40**: 64. 1905.

Representative specimens. COLORADO: Estes Park, *Cooper* 151 (type of *A. Cordineri*), *Osterhout* 5470, *Ashton* 345; The Gunnison watershed, *Baker* 626; Trail Glen, *F. E. and E. S. Clements* 67. WYOMING: *A. Nelson*, Meyersville, 2847 (cotype of *A. Cordineri*); Centennial, 8792; Laramie, 1170; C. Y. Ranch, Big Muddy, 598; Sheridan, 8484. NORTH DAKOTA: Pingree, Stutsman Co., *Lunell*, Aug. 12, 1902.

The author has not seen true *Aster falcatus* Lindl. from Arctic America but it seems unlikely that our Rocky Mountain plant could belong to that species in spite of the extensive ranges characteristic of species in this section. There are no specimens at hand from the Northwest, which is well represented in the Rocky Mountain Herbarium by other species. Our plant does not agree entirely with Lindley's description in the Prodromus. The leaves of our plants are not noticeably falcate and the branches must be considered leafy rather than "paucifoliis," neither are they 3-nerved, a character given for *A. falcatus* by Macoun.[1] However, without seeing authentic *A. falcatus* Lindl. I hesitate to depose the name which Dr. Rydberg has accepted and made familiar, but if it is later shown that our plants are not the same as those from the far north the name *Aster Cordineri* A. Nelson becomes the correct name of this species. It is well represented by material from the mountainous regions of the central and northern part of Colorado and of Wyoming, and extends into North Dakota.

ROCKY MOUNTAIN HERBARIUM,
Laramie, Wyoming.

RECENT DISCOVERIES IN THE NEWFOUNDLAND FLORA

M. L. FERNALD

(*Continued from page 315*)

THE GENUS ANTENNARIA IN NEWFOUNDLAND.—In 1924 I published a brief synopsis of *The Dwarf Antennarias of Northeastern America*, RHODORA, xxvi. 95–102 (1924). At that time 6 species and 2 varieties of the genus were known in Newfoundland. Now, after four additional seasons in the field, we know 16 species and 2 varieties of *Antennaria* on the Island. In view of the great technical difficulty of the group, a new key to the Newfoundland representatives of the genus is offered and the new species are illustrated.

[1] Canadian Plants **1**: 223. 1883.